EVALUATION OF *UNIVERSITI MALAYSIA PAHANG* ONLINE RESOURCES ACCESS WITH MOBILE TECHNOLOGY TOWARDS STRATEGIC KNOWLEDGE MANAGEMENT

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Abstract

In knowledge-based economy, the role of institute of the higher education is very important in shaping the future landscape of a country not only to supply the human capital but also to prepare the people to venture into a changing world economy. Therefore, the function of the related department such as the library in which responsible to manage the knowledge of the institution also becomes more challenging than before. Mobile technology, smart phone in particular, is very useful device not only to access information but it also able to create a new information. This information can be regard as a new knowledge as well. The purpose of our study is to evaluate the Universiti Malaysia Pahang library readiness for implementation of mobile technology such as smart phone and tablet towards strategic knowledge management. We analyzed the data based on the online tracking services provided by Google Analytics services that has been embedded in the two websites that offering the users to access the online materials. The scope of observed data is for four years only, 2011 until 2014. We found that there are more than 248 different devices been used to access the online resources representing 2.13% of overall sessions or typical access through desktop web browsers. The time series analysis using central moving average on segmented quarterly for four years data shows there is a linear incremental pattern of user access by mobile technology. We predict based on the four years data using linear regression analysis. The result shows 35% of incremental is expected for the next year 2015. To conclude, it is very crucial for the library management to consider of taking advantage of the mobile technology particularly smart phone users towards strategic knowledge management.

Keywords : Smart phone, strategic knowledge management, user analytics

INTRODUCTION

In 21st centuries, the economy landscape has change towards knowledge-based economy. Responding to the global and local context of society needs, the Malaysia government has implemented two major transformation programmes namely as Government Transformation Programme (GTP) and Economy Transformation Programme (ETP). Both programmes highlighted the important and critical necessity of Information and Communication Technology (ICT) to be effectively been used towards the success of the government policies. A blueprint of ICT Public Sector Strategic Planning 2011-2015 (MAMPU, 2011), which developed and published by Malaysian Administrative Modernizations and Management Planning Unit (MAMPU) shown that Malaysia's government is committed in using ICT especially in developing the country. This scenario seems directly demands a new strategic changes of the Institute of Higher Education as the main provider of human capital or talent for both public and private sectors in a country. Respond to the job market, where innovation become a strategic valuable tool or asset for sustainable development, the way on how we manage our knowledge become more critical. It also require more effective assisted technology. In fact, quality of university campus facilities are directly affected the academic programme accreditation based on the Malaysia Qualification Framework (Keating, 2011). Therefore, public university in particular the library, which is positively correlated with student success (Miller, 2013), should respond to this new demand. This paper will assess the utilization of library online services and evaluate the potential of using mobile technology particularly smart phone and tablet towards strategic knowledge management.

MOBILE TECHNOLOGY

Mobile technology is a fast growing technology that significantly changes most people manage their work and life (Boretos, 2007). With the Internet convergence, these powerful technologies become irrefutable for the Malaysia government towards developed country in the year 2020. Mobile technology could provide opportunity for offering new library services which would be critical for reshaping scholarship, study, research as well as librarianship (Hahn, 2008). For example, using smart phone camera to scan the books barcode (Chen, Tsai, Girod, Hsu, & Kim, 2010) and to access reader's comment about the book during physical browsing in the library. This approach could possibly increase the interest of the users to enter the library. As for the librarian, the use of visualization on mobile technology could offer a more convenience task for managing book collection and retrieval to the shelves (Jervis & Masoodian, 2013).

STRATEGIC KNOWLEDGE MANAGEMENT

There are many challenges in making knowledge management a success. Implementation of technology can be a success factor or a potential failure factor (Frost, 2014). Mobile technology, specifically smart phone as claimed by Carayannis, Clark, & Valvi, 2013 can be used for strategic knowledge management. If the smart phone can somehow change how its' user behaves (Kim, Briley, & Ocepek, 2015), that means it can be used as a potential catalyst for institutional or organizational change. Figure 1 illustrates our concept on how mobile technology, particularly smart phone can be used towards strategic knowledge

management. User profile could capture details information about the user who can be linked up with student or staff personal information from the central enterprise database. With these details, various models or pattern can be developed to understand the relationships with the users or real respond to the library services. Any library services that accessible through smart phone either to enter the library, circulation services such as books borrowing and renewing or even viewing personal historical borrowed books, time and location can be traced with smart phone access. This detail can be further analyzed to provide an insight to the respective officer. It also can be a better strategize for the library knowledge management including managing the user. User feedback can be seen as a new approach on how users can contribute to add new knowledge in the institution, by providing instant access through smart phone. Responding to a user survey, for example, on quality of service could contribute to reflect the effectiveness of the services. With the spreading adoption of social networking, the role of the library users now can be more active in producing knowledge instead of accessing the knowledge solely (Pan et al., 2015). User feedback also can be used for the user or customer to rate on demand or on site the quality of service provided the library.

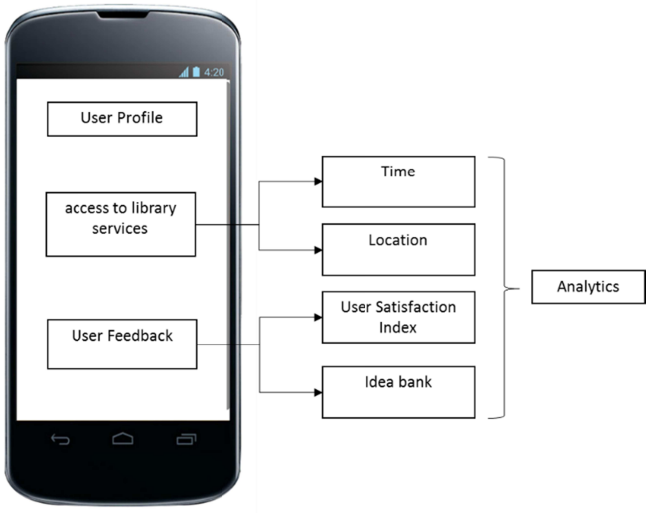

Figure 1 : Concept of Smart phone modules for library user

Although the term knowledge management itself is broad, our emphasize in this paper is on the access to the knowledge resource and how those access information can be further analyzed to be use as a basis for designing a strategic plan for knowledge management.

METHODOLOGY

Our primary data are from quantitative analysis of online access on UMP library website to access the various publications such as online databases and online journals. The web address for the website is *http://ezproxy.ump.edu.my* and has been installed with Google Analytics service (Yang & Perrin, 2014). Google Analytics (GA) is an analytic technology that used to track user or visitor behaviour (Barba, Cassidy, De Leon, & Williams, 2013) on the website that installed with the GA tracking code. This code enables the Google company as a third party service provider to collect data from clients or devices to its central server for analysis. This web analytics service could provide a real time monitoring capability to monitor user access. Figure 2 shows the screen capture of the Google Analytics dashboard. In this study,

we have limited our analysis for □□ur (4) years data from 2011 to 2014 only for mobile device access excluding the access from typical computer (desktop or laptop).

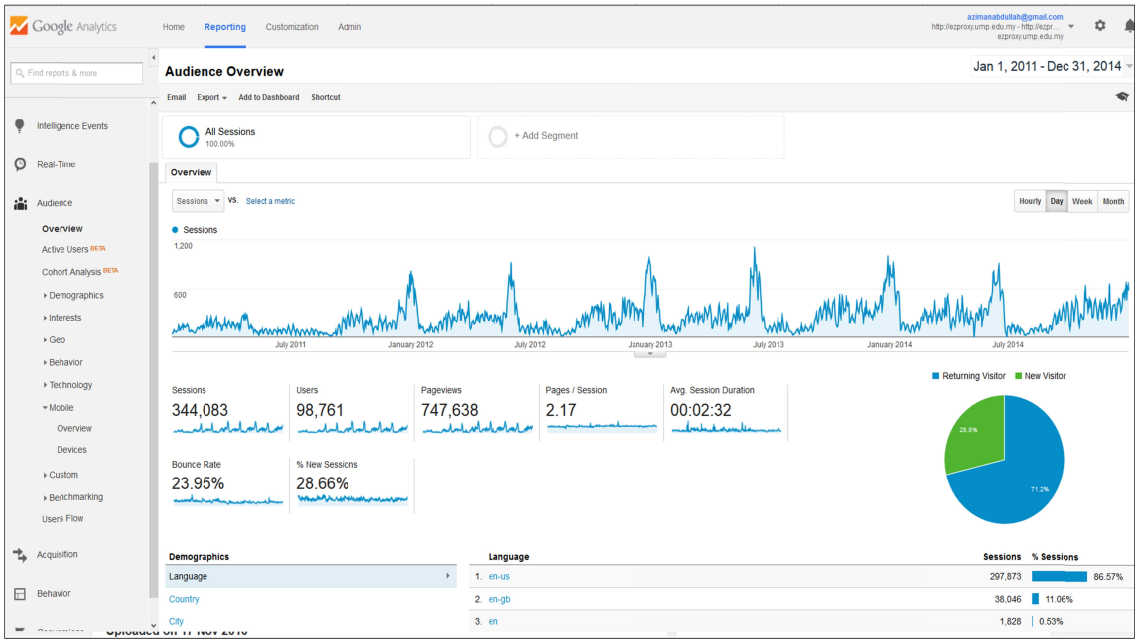

Figure 2 : Google Analytics Service Dashboard

RESULT & DISCUSSION

We access the GA service by using administrator account and export the dataset which compromise 1811 daily records. We then cluster into seasonality data based on the quarter of each year. Table 1 shows the seasonality data represent the number of sessions accessed with mobile devices.

Table 1 : Total Sessions With Mobile Devices Quarterly 2011 - 2014

Year	Sessions by Year Quarter				Total	Annual Increament (%)
	Q1	Q2	Q3	Q4		
2011	9	13	13	126	161	-
2012	119	203	261	476	1059	558%
2013	383	635	521	908	2447	131%
2014	586	937	570	1336	3429	40%

There are more than 200 different devices used to access the website. As a summarize, we only present the distribution of the mobile devices based on the manufacturer as what been tracked by the GA service in Table 2.

Table 2 : Mobile Device Access Distribution based on Manufacturer

Mobile Device Manufacturer	Sessions
Apple	2942
Samsung	2638
Sony	284
Lenovo	185
SonyEricsson	141
Asus	90
Microsoft	62
Feiteng	58
HTC	51
Nokia	39
BlackBerry	37
Xiaomi	36
Google	33
Oppo	29
Alcatel	12
Motorola	12
Mozilla	12
Acer	11
Huawei	11
LG	8
Hisense	7
RIM	6
Amazon	4
Sony Ericsson	4
ZTE	3
DoCoMo	1
Ninetology	1
OnePlus	1
Wiko	1

Based on GA service, a session is defined as the period time a user is actively engaged with the tracked website. We further analyze the seasonal data by using centered moving average and linear regression method to forecast the mobile device accessing the website on the following year 2015. In this paper however, we will not discuss in details those method.

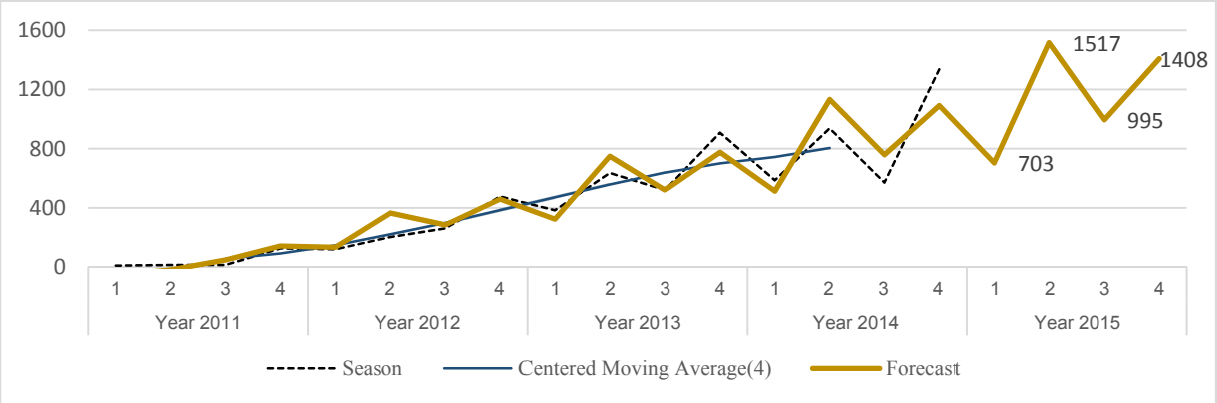

Figure 2 : Forecasted sessions on online library services accessed with mobile devices for 2015

Based on Figure 2, the number of forecasted sessions that shows increment based on the four-year trend. The annual increment of the session accessed with mobile devices is expected about 35% for 2015, represent 4623 total number of forecasted sessions.

We also found that the originated country of the access also not limited to the local country, Malaysia. Figure 3 shows the originated countries on an overlay map that used mobile device to access the website.

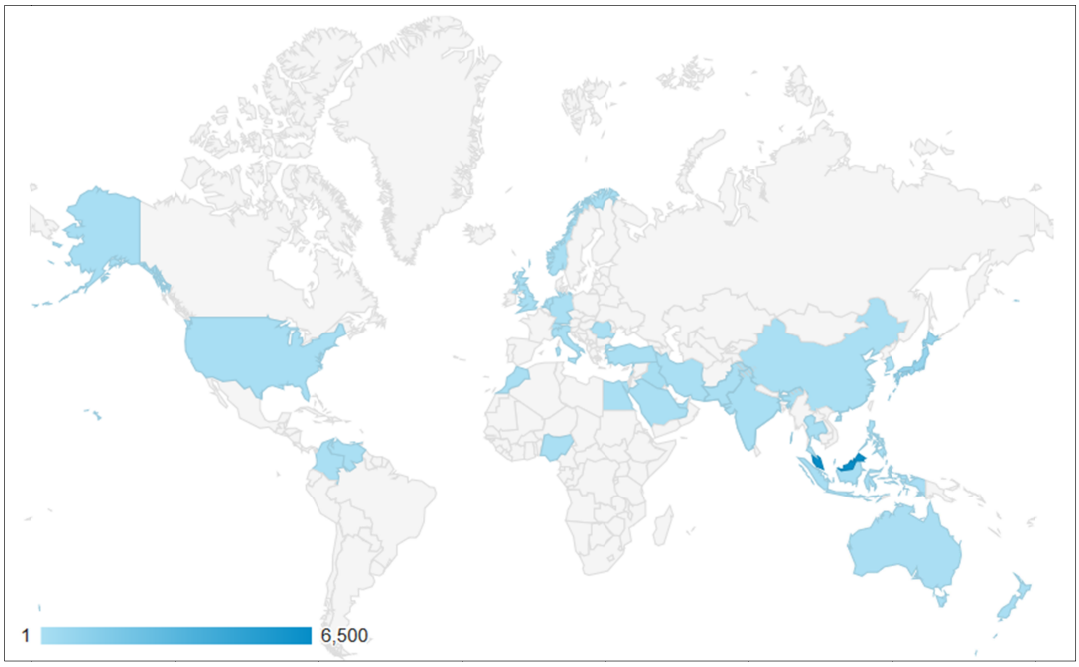

Figure 3 : Overlay Map of the Originated Countries (Mobile Device Access only)

To justify the strategic value of mobile technology, we extract the data from the GA service and the finding shows that location to access the website is not limited only at the UMP campus areas only which are Gambang and Pekan. Figure 4 shows the intensity of mobile

access based on location in Malaysia as we further analyze the exported data from GA to another online Google service called Google Fusion Table.

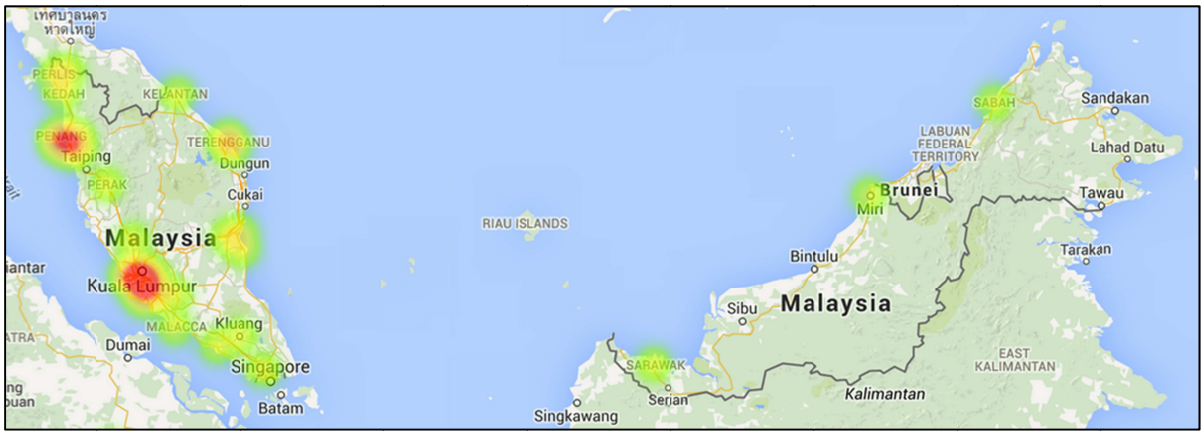

Figure 4: Heat Map Visualization intensitity of Mobile Device Access on the Website

CONCLUSION

In strategic knowledge management, the use of technology is a must. However, the technology itself will not be useful to win or deal with ever-changing challenges on the new demands from the user or customer. Its demands a good tactical by the leader, committed executives, effective collaborative methods and a good user support system (Carayannis et al., 2013). Based on our analysis, we expected that with the use of mobile technology in strategic knowledge management will becoming a strong indicator for the university to consistently leading in the higher education industry as well as preparing the nation to become a developing country. Inter-department involvement is critical on how to take advantage of the mobile technology usage to increase the quality of services and organizational productivity as a result of strategic knowledge management initiatives.

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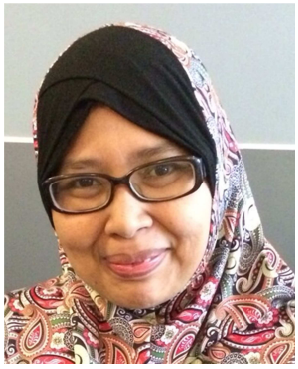
Aziman bin Abdullah is a lecturer at the Faculty of Computer Systems and Software Engineering, Universiti Malaysia Pahang (UMP), Malaysia and currently on study leave in a Doctoral degree program at the Department of Energy and Environmental System Engineering, University of Seoul, South Korea with Malaysia government scholarship (SLAI). He received his Master degree in Internet Computing, 2004 from University of Surrey, UK with Malaysia government support and Bachelor degree in Computer Science, 2000 from Universiti Teknologi Malaysia. His research interest are in e-learning, data visualization, smart phone technology and Internet technology. He was an active member for Majlis E-pembelajaran IPTA (MEIPTA), an e-learning council represented by all public universities in Malaysia. He also has involved in architecting the national IT project called MyGRANTS and various involvement on IT projects in UMP. Previously, he has participated in 16 UMP research projects and recently presented a research paper on smart phone technology used for public reporting related with environmental issue in an international conference organized by UMP.



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